

# Exhibit F

Robert Anderson

September 21, 2006

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CONFIDENTIAL

IN THE UNITED STATES DISTRICT COURT

FOR DISTRICT OF DELAWARE

- - -

TRUEPOSITION INC., : CIVIL ACTION

Plaintiff/ :

Counterclaim :

Defendant, :

:

vs. :

:

ANDREW CORPORATION, :

Defendant/ :

Counterclaim :

Plaintiff. : NO. 05-00747-SLR

- - -

Philadelphia, Pennsylvania  
Thursday, September 21, 2006

- - -

Videotape Deposition of ROBERT JAMES

ANDERSON, taken pursuant to notice, at the  
Renaissance Philadelphia Hotel, 500 Stevens  
Drive, on the above date, beginning at  
approximately 9:09 a.m., before Debra Ann  
Whitehead, an Approved Reporter of the United  
States District Court and Notary Public.

- - -

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2 Q. You said that it locates cell phones  
3 on the control channel; is that correct?

4 A. That's what the product did at that  
5 time.

10:03

6 Q. What is "that time" you are  
7 referring to?

8 A. Back when I would have first been  
9 introduced to this patent, in or around early  
10 '98.

10:03

11 Q. Has the product changed since then?

12 A. Yes.

13 Q. In what manner?

14 A. Can you be more specific?

15 Q. Well, you said that at that time the  
16 product located cell phones on control  
17 channels?

10:03

18 A. Yes.

19 Q. Does it continue to locate cell  
20 phones on control channels?

10:04

21 A. Yes.

22 Q. When you say it locates cell phones  
23 on control channels, what do you mean by  
24 "control channel"?

25 A. Channels -- control channels are

10:04

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channels that are used to -- used by the mobile station and the network to communicate signaling informations.

Q. Do control channels communicate anything other than signaling information? 10:04

A. No.

Q. Do you know who Louise Stilp is?

A. Yes.

Q. Who is he? 10:05

A. He is the lead inventor on this patent.

Q. Have you ever spoken with Mr. Stilp?

A. Yes.

Q. Do you recall how many times? 10:05

A. No.

Q. When is the last time you have spoken with Mr. Stilp?

A. I think it's been about a year.

Q. Do you recall what you spoke with Mr. Stilp about about a year ago? 10:05

A. Yes.

Q. What was the subject matter?

A. Lou was looking to get -- he's no longer with the company. He was looking to 10:06

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2 get venture capital for a new company, and  
3 asked if I could be a reference.

4 Q. What did you tell him?

5 A. Yes. 10:06

6 Q. Did you serve as a reference for  
7 him?

8 A. No.

9 Q. Why not?

10 A. They never called. 10:06

11 Q. Was Mr. Stilp ever employed by  
12 TruePosition?

13 A. Yes.

14 Q. Do you recall during what time  
15 period he was employed by TruePosition? 10:06

16 A. He -- Lou was the, really, the  
17 founder of TruePosition. I -- he joined the  
18 company called the Associated Group in 1991, I  
19 believe. I would have to go -- I don't know  
20 the exact date. And was with -- which then 10:06  
21 spun off TruePosition. And I believe he was  
22 with the company until 2002.

23 Q. Mr. Stilp left TruePosition in 2002?

24 A. Yes.

25 Q. Do you know why he left TruePosition 10:07

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2 Q. Do you see the next one of which  
3 says, "Obtain IMEI request"?

4 A. Yes.

5 Q. What's an IMEI request? 11:53

6 A. That is a -- a procedure where the  
7 MSC and VLR, those are typically combined  
8 together, two nodes that are combined  
9 together, in a GSM network. They will request  
10 that a mobile station transmit its IMEI. 11:53

11 Q. What does "IMEI" stand for?

12 A. International mobile equipment  
13 identity. It is an electronic serial number.

14 Q. Can you identify a particular phone,  
15 if you know the IMEI? 11:54

16 A. Yes.

17 Q. And the third thing listed there is  
18 authentication request?

19 A. Yes.

20 Q. What's meant by "authentication  
21 request" here? 11:54

22 A. Authentication is a procedure in  
23 which the -- the GSM network, specifically the  
24 MSC and VLR, can authenticate the validity of  
25 a particular -- a particular mobile station 11:54

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2 and subscriber identity.

3 Q. Of the three things listed here,  
4 null SMS, obtain IMEI request, and  
5 authentication request, did TruePosition ever 11:54  
6 employ any one of those to prompt a mobile to  
7 transmit when in idle mode?

8 A. Yes.

9 Q. Which one or ones?

10 A. Null SMS. 11:55

11 Q. Anything else?

12 A. No.

13 Q. Why did TruePosition decide to use  
14 null SMS?

15 A. Null SMS is possible without 11:55  
16 specific support from the -- the GSM  
17 infrastructure vendors.

18 Q. Is SMS considered traffic data,  
19 control data, or what?

20 A. Can you be more specific or rephrase 11:55  
21 the question?

22 Q. Sure. Is SMS considered traffic  
23 information?

24 A. The actual content of the message  
25 is -- would be considered traffic. 11:56

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2 Q. Is there any part of the SMS that  
3 would not be considered traffic?

4 A. The -- the SMS is a -- it's -- it's  
5 a whole -- really, a process in terms of 11:56  
6 sending a mobile station an SMS.

7 The -- it -- the procedure would  
8 generally involve, assuming that the mobile  
9 station is idle, which is what's implied here,  
10 would involve the GSM network paging the 11:56  
11 mobile station, so sending the mobile station  
12 a message telling it that it needs to interact  
13 with the network. That -- that's really  
14 signaling.

15 The mobile station would -- would 11:57  
16 obtain a -- a standalone dedicated control  
17 channel for some additional signaling.

18 And that signaling would include, as  
19 we discussed before, would include the mobile  
20 station identifying itself, going through an 11:57  
21 authentication process, having the -- having  
22 the data channel, or all the signaling and  
23 data, effectively, it would go over any of  
24 those channels, encrypted.

25 And then, once that phase is 11:57



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2 complete, the SMS would be sent to that mobile  
3 station, the actual content then would be sent  
4 to that mobile station.

5 Q. What channel does the SMS travel 11:57  
6 over in a GSM network?

7 A. The SMS can travel over either --  
8 either an SDCCH or a traffic channel.

9 Q. When you say, "traffic channel," are  
10 you referring to a TCH? Or, what are you 11:58  
11 referring to there?

12 A. I am referring to a TCH.

13 Q. If an SMS transmits over an SDCCH,  
14 does the entirety of the SMS transmit over the  
15 SDCCH? 11:58

16 A. That -- that's -- that can vary.  
17 It's actually up to the random implementation  
18 to assign whatever channel it chooses to  
19 assign to convey that information.

20 Q. Are you aware of any GSM systems in 11:58  
21 which the entirety of the SMS transmits over  
22 the SDCCH?

23 A. No, I'm not knowledgeable.

24 Q. You don't know one way or the other?

25 A. I don't know one way or the other. 11:58

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2 MR. PARKS: Could you mark this  
3 as the next exhibit, please.

4 (Document marked for  
5 identification as Anderson Exhibit 6.) 11:59

6 BY MR. PARKS:

7 Q. You have just been handed what's  
8 been marked as Exhibit 6. This is a document  
9 produced by TruePosition in this case bearing  
10 Document No. TPI-E 0010295. 11:59

11 Can you take a look at this document  
12 and tell me if you know what it is?

13 A. Yes.

14 Okay.

15 Q. Do you know what this document is? 12:01

16 A. Yes.

17 Q. What is it?

18 A. This document is a test plan of our  
19 Wireless Location System that was planned to  
20 take place in Wilmington, Delaware. 12:01

21 Q. And it was a trial that was to take  
22 place in the 2001 time frame or 2002 time  
23 frame?

24 A. 2001.

25 Q. Did the trial take place in 2001? 12:01

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2 A. Yes, I see that.

3 Q. What did you mean by "the GSME 7  
4 Part B LBS Scope of Work document"?

5 A. That is -- this is the document 01:54  
6 within the RFP that defined what location  
7 technology capabilities that STC was looking  
8 for.

9 Q. And that's a section that you said  
10 you had read before; is that correct? 01:54

11 A. Yes; yes.

12 Q. The third question says, "Is Andrew  
13 offering to provide a location solution locate  
14 GSM mobile phones by performing U-TDOA and/or  
15 AoA on the uplink signal while the mobile 01:54  
16 phone is assigned an SDCCH?"

17 Do you see that?

18 A. Yes, I do.

19 Q. What was the purpose of posing that  
20 question? 01:55

21 A. Again, it's similar to No. 1. If  
22 Andrew -- you know, we were looking at, you  
23 know, potential things that would point to  
24 infringement on the '144 patent.

25 If Andrew is offering a solution 01:55

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2 which locates mobile stations using U-TDOA  
3 while on the standalone dedicated control  
4 channel, then that's -- that's a system that's  
5 likely infringing on the '144 patent. 01:55

6 Q. What's the basis for your belief  
7 that a system that locates mobile phones using  
8 U-TDOA on what you have termed a reverse  
9 control channel infringes on the '144 patent?

10 A. Would you repeat the question. 01:55

11 MR. PARKS: Could you read it  
12 back, please.

13 (The reporter read the record  
14 as requested.)

15 MR. PARKS: Reverse control 01:56  
16 channel.

17 A. (Continued.) The basis is my  
18 understanding of -- I'm sorry. Could you  
19 repeat it one more time. I apologize.

20 MR. PARKS: Could you read it 01:56  
21 back, please.

22 (The reporter read the record  
23 as requested.)

24 A. (Continued.) My basis is my reading  
25 of the '144 patent. 01:56

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Q. Have you ever done any analysis of the Andrew system as it relates to the '144 patent?

A. I have no direct knowledge of the Andrew system. 01:57

Q. If you have no direct knowledge of the Andrew system, then what is the basis for your opinion that Andrew is infringing the '144 patent? 01:57

A. The basis is that a -- if a -- a company that is stating to be compliant with the majority, or potentially all, aspects of the RFP, that they are -- based on that, that they would likely be infringing on the '144 patent. 01:57

Q. Anything else?

A. No.

Q. Do you see Paragraph 4 of Exhibit 10 where it says, "Is Andrew offering to provide a solution to support U-TDOA and/or AoA Mobile Terminated Location Requests (MT-LR), Mobile Originated Location Requests (MO-LR), Network Induced Location Requests (NI-LR) for scenarios where the MS starts in the idle 01:58

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state?"

Do you see that?

A. I do see that.

Q. What did you mean by "Mobile  
Terminated Location Request"? 01:58

A. That is a location request that  
is -- that would come from the -- come from  
the network, not from the -- not from the  
mobile. 01:59

Q. What did you mean by -- strike that.  
When you say, "from the network," do  
you mean the GSM cellular network?

A. Yes.

Q. What did you mean by "Mobile  
Originated Location Request"? 01:59

A. That would be a location request  
that would come from the mobile station  
itself.

Q. And what did you mean by "Network  
Induced Location Request"? 01:59

A. That would be a location request  
that's induced by the network.

Q. In Paragraph 4 of Exhibit 10 were  
you saying that, if Andrew provides a U-TDOA 01:59

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2 and/or AoA location technology for MT-LR, that  
3 that would mean Andrew was infringing the '144  
4 patent?

5 A. It would mean that Andrew is likely 02:00  
6 infringing the '144 patent.

7 Q. Why do you say, "likely"?

8 A. Because it is possible that, in  
9 those idle states, that the mobile station  
10 could be put onto a traffic channel and not a 02:00  
11 control channel.

12 Q. If the mobile station were put on a  
13 control channel, would MT-LR still infringe  
14 the '144 patent?

15 A. Yes. 02:00

16 Q. If the mobile phone were put on the  
17 traffic channel, would MT-LR still infringe  
18 the '144 patent?

19 A. No.

20 Q. If the mobile phone were put on a 02:00  
21 channel that carried signaling information and  
22 traffic information, would that infringe the  
23 '144 patent?

24 MR. MILCETIC: Objection.

25 You can answer. 02:01

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2 A. Could you be more specific?

3 Q. Sure.

4 MR. PARKS: Can you read back,  
5 please, the last question and answer. 02:01

6 (The reporter read the record  
7 as requested.)

8 BY MR. PARKS:

9 Q. Let me try it again.

10 If the mobile phone were put on the 02:01  
11 channel that carries traffic and signaling  
12 information, would MT-LR still infringe the  
13 '144 patent?

14 A. Which channel are you referring to?

15 Q. Any channel that would carry 02:01  
16 signaling and traffic information.

17 MR. MILCETIC: Objection.

18 You can answer.

19 I am letting him answer these  
20 hypothetical questions. He is a fact 02:02  
21 witness. But, go on. I just want to  
22 make my objection for the record.

23 A. I guess I still don't understand  
24 what kind of channel you are referring to.

25 Q. Are you aware of any channels in the 02:02



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2 GSM system that would carry both signaling and  
3 traffic information?

4 A. Yes; a traffic channel would carry  
5 both signaling and traffic information. 02:02

6 Q. Any other channels, other than the  
7 traffic channel?

8 A. Not that I am aware of.

9 Q. And you testified earlier that if  
10 the mobile phone were on the traffic channel, 02:02  
11 MT-LR would not infringe the '144 patent; is  
12 that right?

13 A. That's correct.

14 Q. Paragraph 5 of Exhibit 10 says, "Is  
15 Andrew offering to provide a solution to 02:03  
16 support U-TDOA and/or AoA using the Any Time  
17 Interrogation (ATI) procedure or SMS to force  
18 a mobile phone in the idle state to the active  
19 state?"

20 Do you see that? 02:03

21 A. Yes, I do.

22 Q. Why did you pose that question?

23 A. That was, again, another option for  
24 locating an idle mobile that was defined in  
25 the STC RFP. 02:03

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2 Q. Does that question that you posed in  
3 Paragraph 5 relate to the '144 patent?

4 A. Yes, it does.

5 Q. What does it mean to use SMS to 02:03  
6 force a mobile phone in the idle state to the  
7 active state?

8 A. Using SMS to force a phone from the  
9 idle state to the active state is actually a  
10 procedure I had described earlier. 02:04

11 That if a -- if a short message is  
12 sent to a phone, there is a procedure which  
13 will page the mobile station; and then the  
14 mobile station will be assigned a channel; and  
15 that channel will be used for the normal GSM 02:04  
16 signaling process, which includes steps of  
17 authentication, deciphering; and then that  
18 channel may be used to transfer that SMS from  
19 the -- from the network to the mobile station,  
20 or a different channel may be assigned to do 02:04  
21 that.

22 Q. The end of Exhibit 10 says, after  
23 the five questions, "If the answer is yes to  
24 any one of these questions Andrew is  
25 infringing on the '144 patent owned by 02:05

# Exhibit G

UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE

TRUEPOSITION, INC. AND KSI, INC.,

Plaintiffs/ Counterclaim Defendants,

v.

ALLEN TELECOM INC.,

Defendant/ Counterclaim Plaintiff

Civil Action No. 01-0823-GMS

Expert Report On Validity  
of the '555, '013, '192, and '959 Patents

By Professor Stuart C. Schwartz

My name is Stuart C. Schwartz. I am a professor of Electrical Engineering at Princeton University. I provide this report on behalf of plaintiffs TruePosition and KSI in response to Allen's expert reports regarding United States Patents Nos. 6,119,013 ("the '013 Patent"), 6,108,555 ("the '555 Patent"), 6,047,192 ("the '192 Patent") and 4,728,959 ("the '959 Patent"). A discussion of my educational background and employment history has been given in a previous expert report, dated July 15, 2003, on infringement. (See paragraphs 1-9 and attachment No.1 of that report.) That report is incorporated herein in its entirety as attachment 1.

I. Assignment

1. I have been asked to opine on issues of validity of Claim 1 of the '013 Patent, Claims 1, 2, 19, 20, 22, 24 and 45 of the '555 Patent, Claims 14-16 and 18-20 of the '192

7. In addition, in preparing my analysis and report, I have relied extensively upon my understanding of wireless communications, random processes, and statistical communication theory that I have gained through a 37 - year career in industry, consulting and teaching and research at Princeton University.

**IV. Communication Technology Involved in the '555, '013, '959, and '192 Patents**

**A. Overview of Cellular Wireless Communication Systems and the Four Asserted Patents**

8. All four patents deal with finding the location of a mobile subscriber (MS), i.e., a cell phone, in a cellular wireless communication system, by using the radio waves transmitted by the MS. At this point, it is useful to have a general overview of a wireless communication system.
9. A cellular wireless communication system consists of a series of base stations (BS) all connected to a wired infrastructure, through controllers and switching centers. The wired infrastructure is the connection to the Public Switched Telephone Network (PSTN) and land-based subscribers, e.g., the telephone in your home. Each BS, when it wants to communicate with another BS uses the wired part of the system. The wireless channel is the communication link between the BS and the MS. The service area of a BS is a geographic area that is sometimes defined by a hexagon, and called a cell.
10. When a MS is active, it is being served by a single BS, typically the BS which serves the geographic area the MS is located in. (In some systems, a MS can be simultaneously served by two or perhaps three BS's.) The radio signals transmitted by the MS are usually received best by the BS serving the geographic area where the MS is

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located. This is not always true, especially in the cases where the MS is located at the boundary of the hexagon. Other neighboring BS also receive the radio signals.

11. The title of the '555 patent is "Enhanced Time Difference Localization System."

The patent teaches methods and systems for locating a mobile radio in a wireless communication system such as a cellular telephone system. Timing information of received MS signals at two base stations is used in conjunction with collateral information to determine position.

12. The '013 patent is also entitled "Enhanced Time Difference Localization System,"

and is a continuation of the '555 patent. Claim 1 of this patent teaches a system for locating a MS with the timing information of received MS signals at two sensor stations and collateral angle of arrival information.

13. The title of the '959 patent is "Direction Finding Localization System." The '959

patent teaches systems and methods to obtain angle of arrival measurements from radio signals emitted by mobile transmitters. By combining these types of measurements from more than one base station in a wireless communication system, an estimate of the MS location is obtained.

14. The title of the '192 patent is "Robust, Efficient, Localization System." The '192

patent teaches certain systems and procedures for locating radio transmitters by means of matched replica correlation processing with voice related data.

**V. Opinion Regarding Levels of Ordinary Skill in the Art and Assumption Regarding Validity**

15. Based on my 37 years of study, teaching and research experience in the field of communications, I have reached conclusions concerning issues of validity for the '555, '013, '959, and '192 patents. In the following, I will discuss in more general terms validity issues. In my analysis below, I have cited to some of the documents and materials that support my opinions. At trial, I may testify regarding other documents and materials that provide further support for my analysis.

**A. Level of Ordinary Skill in the Art Defined by the '555, '013, '959, and '192 Patents**

16. For purposes of my opinions in this report, I believe that a person of ordinary skill in the art of radio communication technology in the late 80's to the present would have obtained a bachelor's or master's degree in electrical engineering, physics, or a similar technical discipline with some experience in the industry. (Throughout the remainder of this report, I will refer to the level as that of "a person of ordinary skill.") For each patent analyzed below, the person of ordinary skill would have had this level of skill at the time of the filing of the application leading to the issuance of the respective patent.

**B. Basis for Invalidity**

17. It is my understanding that in order to invalidate a patent claim as anticipated, a single piece of prior art must expressly disclose each and every element of the claim, arranged in the same way as claimed and must enable one skilled in the art to make and use the invention. If a single piece of prior art does not expressly teach each element of the claim, then it is my further understanding that the piece of art anticipates the claim

only if a person of ordinary skill in the art would understand that the elements are necessarily present in the piece of art. I understand that this is referred to as inherency.

18. It is also my understanding that a patent claim is obvious if the differences between it and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art. I understand that in making this determination there are four inquiries. First, the scope and content of the prior art must be determined. Second, the level of ordinary skill in the art must be considered. Third, the differences between the claimed invention and the prior art must be determined. Fourth, other factors such as commercial success of the invention, long felt but unresolved need, failure of others, copying and unexpected results, should be considered. It is my further understanding that in order to combine references, there must be a proper motivation to do so.

19. In my analysis I have assumed that the references relied upon by Allen's experts are prior art. I understand that whether references actually constitute prior art is a legal determination.

## **VI. Validity of the '013 and '555 Patents**

### **A. Overview of the '013 and '555 Patents**

20. The '013 and '555 patents have the same title "Enhanced Time Difference Localization System," and the same specifications. Both patents teach a procedure to locate a MS by using time of arrival (TOA) information from two sensor stations (which are typically located at the BS), augmented by collateral information.
21. TOA information is a signal processing technique to determine position. As discussed in my previous infringement report, TOA measurements from two BS's are



used to determine a hyperbola. The intersection of two hyperbolas would give the possible position(s) of the MS. However, to generate more than one hyperbola, more than two BS's are required. The patents recognized that this may not be feasible in certain areas of the cellular system, especially rural areas where BS's tend to be separated by larger distances, and the MS radio signal is only received at two BS's. The '013 and '555 patents teach how to augment TOA information with other, collateral information. In one case, the '013 patent claims using AOA information as the collateral information. If an operator did not want to go to the expense of adding antenna array elements so as to obtain AOA information, then other collateral information such as highways and topographical road information may be used. The '555 patent claims determining position based on TDOA and any type of collateral information. Both patents can be viewed as teaching a "minimalist" system, i.e., doing geolocation with minimal cost and minimal disturbance to the existing cellular communication system and with minimal number of base stations. Furthermore, this "minimalist system is one that relies primarily on TOA measurements to obtain a TDOA. That may very well be why the applicants chose to change the name during the prosecution history from "Communication Localization System," to the present title, "Enhanced Time-Difference Localization System," thus emphasizing that the wireless location system is primarily TOA based, and that the TDOA measurement is augmented with other collateral information.

**B. Mr. Kahn's Report**

22. I have read Mr. Kahn's report purporting invalidity of certain claims of the '013 and '555 patents. I disagree with Mr. Kahn's conclusions. The basis of my opinion is discussed below.
23. The asserted claims are: Claim 1 of the '013 patent and Claims 2, 22, 24 and 45 of the '555 patent. Although the Kahn report does not explicitly state that the references he cites anticipate the '013 and '555 patents, that is the thrust of his discussion. As discussed above, to anticipate a claim the document must expressly teach each element of the claim or must be inherent in the apparatus or method. In order to respond to the Kahn report, I will address each element of each of the asserted claims.

**1. Claim 1 of the '013**

24. Claim 1 of the '013 patents reads:

An apparatus for locating a mobile radio transceiver in an operating environment served by a wireless communication system, comprising:

two sensor stations of known location that receive a radio signal from the mobile transceiver, each sensor station having an inter-site synchronization mechanism for common time standard maintenance, and each sensor station further having a corresponding signal characterization processing unit that determines, from the radio signal, time of signal arrival information;

a source of collateral information related to a location of the mobile transceiver, wherein the collateral information comprises angle of arrival information determined from the radio signal;

a processing unit that determines time difference of signal arrival information based on the time of signal arrival information determined by each said signal characterization processing unit; and

a processing unit that determines a probable position of the mobile transceiver based on the time difference of signal arrival information and the collateral information.

25. Claim 1 has a preamble and four elements. The preamble describes a wireless communication system with a mobile radio transceiver, i.e., a MS. The first element recites two sensor stations, the BS's, that have a mechanism for time synchronization. In addition, each BS has a signal characterization processing unit that can determine TOA information from the received radio signals.
26. The second element recites a source of collateral information which is related to the MS location. This collateral information is AOA information which is derived from the received radio signals. The third element requires a processing unit that determines the TDOA from the TOA information which was obtained by each signal characterization processing unit located at each BS.
27. The fourth, and final element is a processing unit that determines an estimate of the MS based on the TDOA estimate and the collateral information which, in this case, is AOA information.
28. The Kahn report first analyzes Claim 1 of the '555 patent. This is identical to claim 1 of the '013 except that claim 1 of the '555 patent does not specify the kind of collateral information.
29. Mr. Kahn first analyzes a TOA/TDOA-only system. The '013 and '555 patents do not claim the invention of TOA/TDOA, so the Kahn discussion on this subject does not address the issue of anticipation. The '013 and '555 patents claim a minimalist system that augments a single TDOA measurement. None of the purported prior art cited by Mr. Kahn teaches the claimed system.

30. The Kahn reference, D. C. J. Driscoll & Associates, "Survey of Location Technologies to Support Mobile 9-1-1," Edition 1.0, July 1994 is just what it says – a survey of what companies were doing. Mr. Kahn relies primarily upon the discussion of the ERA system set forth in the Driscoll survey. This discussion of the ERA system is very high level and is not enabling. Driscoll's discussion of the ERA system fails to teach at least four elements of the claim.
31. The claim requires that the two claimed sensor stations have a "signal characterization processing unit that determines, from the radio signal, TOA information." Mr. Kahn relies on the discussion of ERA in the Driscoll survey which does not expressly teach determining TOA information with a signal characterization processing unit. In fact, it does not mention determining TOA at all in the discussion of the ERA system. Thus, this element is not taught by the Driscoll survey's discussion of the ERA system.
32. The claim requires a "source of collateral information related to a location of the mobile transceiver, wherein the collateral information comprises angle of arrival information determined from the radio signal." The Court has construed "collateral information" as "transceiver location information that is supplementary to time of signal arrival information." Therefore, in this claim, the AOA information must be supplementary. The Driscoll discussion of the ERA system does not teach a system that has AOA as supplemental information. Rather, it teaches a system that uses AOA at every BS and refers to the processors as E\_CAPS Direction Finding System (DFS). Each DFS has an 8-element antenna array, i.e., AOA antenna, and computes AOA of the MS.

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(Page 18 of Driscoll survey.) In a system where AOA is everywhere such as this one, AOA is not supplemental or collateral to TOA.

33. The claim requires a “processing unit that determines time difference of signal arrival information based on the time of signal arrival information determined by each said signal characterization processing unit.” The Driscoll survey discussion of the ERA system does not mention obtaining TOA measurements. Therefore, there is no mention of the required processing unit that determines TDOA from TOA measurements.
34. The claim requires “a processing unit that determines a probable position of the mobile transceiver based on the time difference of signal arrival information and the collateral information.” The Court has construed this phrase to mean “a processing unit that determines a probable location of a mobile transceiver from the following information: (1) the difference between the time of the arrival of the signal at the first sensor station and the time of the arrival of the signal at the second sensor station; and (2) the collateral information.” The Driscoll survey discussion of the ERA system does not mention a processor that combines one TDOA and one piece of collateral information which, for this claim, is AOA information. The Driscoll survey summarizes the ERA system at such a high level, that there is no teaching of how the measurements are combined, if at all, to obtain MS position estimates. Thus, the Driscoll survey’s discussion of the ERA system fails to teach this element of the claim and fails to enable a person of ordinary skill in the art how to make and use this claim element.
35. The Kahn report, in referring to the Driscoll survey also cites other systems described in the survey. He seems to recognize that they do not anticipate the claim: “While these examples may not directly pertain to TOA/TDOA systems, or may not

specifically claim to allow processing with only two sensors, they are included here for completeness to highlight the prevalence of this line of thought, during the early 1990s.” (page 7, Kahn report) I agree with him that these systems do not anticipate the claim.

36. The Kahn reference, “On-Going Cellular Geolocation Based IVHS Operation Test,” by J. Kennedy, October 1994, describes an on-going operational test of a cellular geolocation system. Mr. Kahn refers to it as system that uses ‘both angle-of-arrival and TDOA estimates.”
37. The collateral information clause discussed above (element 2 of the claim) is not taught in the Kennedy reference. As indicated on page 14 of the reference, AOA measurements are obtained at every BS and are not collateral or supplemental to TOA measurements. The figure teaches that there is an AOA antenna at every BS and page 17 teaches generating both AO A and TOA measurements at each BS.
38. The processor that determines position discussed above, element 4 of the claim, is not taught in the Kennedy reference. The reference does not teach combining a TDOA measurement with an AOA which is collateral or supplementary. Furthermore, there is no teaching of what algorithms are used to generate the MS position estimate. Thus, the Kennedy reference fails to teach element 4 of the claim and fails to provide a disclosure that would have enabled a person of ordinary skill in the art how to make and use this claim element.
39. Mr. Kahn also refers to a European patent (Ref. F) that does not teach AOA and a brief by KSI to the FCC (Ref G) that does not teach AOA as collateral information as claimed.

40. In regard to the issue of obviousness, it is not clear from reading Mr. Kahn's report, what documents and in what combination, if any, he regards as germane. In fact, it is not clear to me he concludes that Claim 1 of the '013 is obvious based on some unspecified combination of the prior art. In my opinion Claim 1 of the '013 is not obvious over the four documents cited by Mr. Kahn. Indeed, as we discussed above, all the references have missing elements of the claim. None of them alone or in any combination teach or suggest a system that uses TOA measurements and a collateral, or supplemental, AOA measurement to obtain MS position.
41. In considering the non-obviousness of Claim 1 of the '013 patent, I have also considered that after the application for the '013 and '555 patents were filed, Raytheon tried to develop a geolocation system for Motorola. According to Allen's witnesses, that system included an AOA antenna at every site and did not use TDOA and collateral information. I understand that Motorola rejected the AOA everywhere type system, and Raytheon discontinued the project. (Boyle Deposition, pages 120 and 129) This failure of Raytheon to develop the claimed invention indicates that the invention was not obvious to one of ordinary skill in the art.
42. Furthermore, the Driscoll survey of 1994, discusses developing systems by numerous companies, none of which disclose the claimed system. The failure of these companies to disclose the claimed system also indicates the non-obviousness of the claimed invention.
43. I have also considered commercial success of the claimed invention. I understand that Allen has sold millions of dollars worth of geolocation equipment, the Geometrix system, to AWS and Verizon. As I explained in my infringement report, these systems

infringe the claim. Allen has marketed its Geometrix product based on having the claimed invention. For example, the Geometrix Web page ([www.geomatrix911.com/e911.html](http://www.geomatrix911.com/e911.html), page 3 of 6) states: "In most applications, Geometrix meets performance requirements using only TDOA sensors. In certain circumstances, TDOA sensors are augmented with AOA capability to improve coverage and accuracy. One example of this is the coverage of a rural highway where the cell site arrangement is in a line along the highway. TDOA-only systems must overcome increased propagation loss for three-site reception. The geometry of the cell site placement challenges both TDOA-only and AOA-only systems. However, a combination of these techniques in Geometrix produces an accurate position calculation from only two sites." Thus, Allen's successful sales of its Geometrix product can be attributed to, at least in part, to the claimed invention. This commercial success of the claimed invention indicates its non-obviousness.

44. I have also considered the need for a commercially viable accurate geolocation system as demanded by the wireless carriers. When the patent was filed in 1996, there was no such system. Carriers had rejected the proposed systems as too expensive or not accurate. Prior to the filing of the application that led to the issuance of the '013 patent, none of the carriers bought and implemented any of the systems discussed in the 1994 Driscoll survey. It has only been with the claimed invention that a network overlay geolocation system was put into operation. This long felt need, solved by the patent is yet another indication of the non-obviousness of the invention.

**2. Claim 2 of the '555**

45. Claim 2 is a dependent claim that depends on claim 1.



Claim 1 of the '555 patents reads:

An apparatus for locating a mobile radio communications transceiver in an operating environment served by a wireless communications system, comprising:

two sensor stations of known location that receive a radio, signal from the mobile transceiver, each sensor station having at inter-site synchronization mechanism for common time standard maintenance, and each sensor station further having a corresponding signal characterization processing unit that determines from the radio signal, time of signal arrival information;

a source of collateral information related to a location of the mobile transceiver;

a processing unit that determines time difference of signal arrival information based on the time of signal arrival information determined by each said signal characterization processing unit; and

a processing unit that determines a probable position of the mobile transceiver based on the time difference of signal arrival information and the collateral information.

46. Claim 2 includes the limitations of claim 1 of the '555 patent and further includes the following limitations:

An apparatus for locating a mobile radio communications transceiver in a wireless communications system as claimed in claim 1, wherein the collateral information comprises databased information.

With one exception, claim 2 of the '555 patent is identical to claim 1 of the '013. In the '013 the second element specifies that the collateral information is AOA measurements.

Here, in claim 2, the type of collateral information is databased information.

47. With respect to Claim 2, Mr. Kahn appears to rely only on exhibit F. First, this document was considered by the PTO examiner in its processing of the '555 and '013 patent applications. Thus, the examiner considered the claim patentable over this

document. I also believe this to be the case. The document teaches a system of using BS's to obtain range rings by sending to the MS "acknowledgement-request signals" from which the system determines round trip time and hence, distance of the MS from the BS. These range rings are used to obtain a MS location estimate. The European patent application fails to teach the claimed processing unit that determines TOA, the claimed source of collateral information, the processing unit that determines TDOA, and the processing unit that determines position of the MS from the TDOA and the collateral information. Indeed, the document uses a "digitised road map" to correct an already determined position, as Mr. Kahn quotes: "comprising means for storing data representing a road map and means for correcting the said estimate by making an assumption that the moveable station is located on a road." Correction of an already determined position is not what is required by claim 2 of the '555. Given the lack of teaching of all the elements of the claim, in my opinion claim 2 is not anticipated and not obvious over the reference.

### **3. Claim 22 of the '555**

48. Claim 22 is also dependent on Claim 1. Since I have already discussed Claim 1, I will limit my discussion to the further limitation added by Claim 22. Claim 22 reads:

The apparatus of claim 1, wherein the probable position is determined based only on said time difference of arrival information and said collateral information.

This claim limits the determination of MS location only to TDOA information and collateral information.

49. Mr. Kahn appears to rely only on Refs. D and E, with respect to this claim. As stated above, with reference to Claim 1 of the '013 patent, these references do not teach several elements of the claim. Since he relies on only references D and E, my analysis for Claim 1 of the '013 applies equally here.

**4. Claim 24 and 45 of the '555**

50. Claims 24 and 45 are method claims that are similar to the system claims described above. Therefore, my analysis of Claim 2 applies to Claim 24 and my analysis of Claim 22 applies to Claim 45.

**5. Claims 1, 19 and 20 of the 555 patent**

51. Although claims 1, 19 and 20 are not asserted, Mr. Kahn discusses them. My analysis of claim 1 of the '013 patent and claim 2 of the '555 patent applies to these claims. In his discussion of claim 1 of the 555 patent, Mr. Kahn also cites to the FCC filing by Mr. Hinkle. This document fails to cure the deficiencies in the teachings of the other references. In fact, this document contrasts TDOA systems with other types of systems and characterizes them as economically infeasible and significantly less accurate relative to the direction finding (DF) approach (Ex. F. to Mr. Kahn's report at Appendix C, page 5).

**VII. Validity of the '192 Patent**

**A. Overview of the '192 Patent**

52. The '192 patent is titled: "Robust, Efficient, Localization System." It teaches the use of correlation methods to obtain measurements that are useful for geolocation purposes. The claimed correlation processing is a signal processing technique to look for

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similarities and differences between two different signals. Typically, one of the signals is a noise corrupted version of the second signal. The claimed correlation processing produces location measurements, such as TOA measurements, which can be used to obtain TDOA estimates. The claimed correlation processing can also be used in obtaining other parameters such as AOA measurements and Doppler measurements.

53. One of the teachings of the patent is the use of “matched-replica” correlation processing. Oftentimes one does not know the signal that should be used in the correlation. A teaching of the ‘192 patent is to use a processing unit at the BS to demodulate a voice signal. This is the BS associated with the strongest signal or, as stated in the art, the highest signal-to-noise ratio (SNR). If processing units at a few BS’s demodulate an incoming signal and get slightly different messages, the system has the most confidence that the BS associated with the highest SNR has the best answer, i.e., has demodulated the message correctly. The patent teaches that one takes this particular demodulated signal, or more precisely, a reduced-data representation of the modulated signal, and transmits it to all the other BS’s which have received the noisy signal. They all perform correlation with a reconstruction of the reduced data form obtained at the site with the best signal. This replica, which came from the BS with the highest SNR, or some other measure of correctness, is then used to do another correlation. Since the correlators at the various BS’s are now looking for a signal buried in noise which they know (the replica which they received from the “best” BS), the respective correlations will lead to better estimates of TOA or AOA. What they are performing during this correlation with the noisy signal is called “matched-replica correlation processing” by the patent. Figure 6 of the ‘192 patent illustrates the replica correlation processing at two

BS's which are obtaining TOA, TDOA and AOA information. Figure 7 of the '192 patent shows the received noisy signal at the first BS, the demodulation, the transfer of the reduced-data representation of the modulated signal to the second BS, the remodulation of the reduced-data representation, and the subsequent "matched-replica correlation processing."

**B. Dr. Ellingson's Report**

**1. Claim 16 of the '192 Patent**

54. Claim 16 of the '192 patent is dependant on Claim 15. Claim 15 reads

An system for locating a mobile radio transmitter, comprising:

- at least first and second sensor stations, each sensor station having an antenna for receiving a signal from the mobile radio transmitter and a timing mechanism to time-tag an identified, representative instant of the received signal to produce time-tagged received signal data;
- at least first and second signal replica units at the first and second sensor stations, respectively, each signal replica unit providing replicated signal data,
- at least first and second signal correlation and measurement extraction processing units at the first and second sensor stations, respectively, each correlation and measurement extraction processing unit performing matched-replica correlation processing with the time-tagged received signal data and the replicated signal data to produce location-related signal parameters;
- a communications system for communicating the location-related signal parameters from the sensor stations to a central site;
- means for estimating the position of the mobile transmitter from the location-related signal parameters; and
- an output for indicating the estimated position of the mobile transmitter,

wherein

the signal replica unit at at least the first sensor station comprises a reduction mechanism to reduce the time-tagged received signal data,

the communications system communicates the reduced time-tagged received signal data between at least the first sensor station and the second sensor station, and

the signal replica unit at at least the second sensor station comprises a reconstruction mechanism to reconstruct the reduced time-tagged received signal data and to use the reconstructed time-tagged received data as the replicated signal data,

wherein the replicated signal data comprises voice related data.

Claim 16 reads:

A system according to claim 15, wherein the location-related signal parameters comprise times-of-arrival information.

55. With respect to Claim 16, Dr. Ellingson's report relies only on U.S. Patent No. 5,327,144, "Cellular Telephone Location System." ('144 patent or Stilp) Based on his analysis, it is not clear whether Dr. Ellingson is opining on anticipation or only obviousness. I will address both issues below. In my opinion Claim 16 of the '192 patent is neither anticipated nor rendered obvious by the '144 patent.
56. The patent office considered the '144 patent and found the '192 claims to be patentable over the '144. I agree with the patent office.
57. Before discussing the claims and the '144 patent in detail, it is helpful to discuss some background involving the '144 and the '192 patents and, in particular, the differences between control channels, control signals, voice channels, voice signals, and voice data. In 1995 and 1996, a person of ordinary skill in the art would have been aware that a wireless cellular communication system had two types of channels – a control channel and a voice channel. The control channel allows messages to be communicated between the MS and BS for the proper operation of the wireless communication system, i.e., to exchange system control information. For example, on the reverse control

channel, the MS can tell the system which BS serving area it is located in during the idle state, when it wants to make a call, and the number it wants to call. (On more advanced wireless system, this is the channel the MS will use to request additional user channels when it wants to transmit high speed data, e.g., wireless laptop communications.) On the forward control channel, the BS can page the MS when there is an incoming call and assign a voice channel.. The voice channel, on the other hand, contains both user information (voice and other user data) and certain system control information. Typically, the voice channel has link control information such as power control signals. In AMPS, the supervisory audio tone, the SAT signals, are located on the voice channel, as well as "handoff" messages on the forward voice channel. The "supervisory tone" (ST) is also included on the voice channel in an AMPS system.

58. During the period 1995-1996, AMPS was the prevalent wireless communication system as 2G systems, i.e., the newer digital systems, were at their initial deployment stage. The distinction between control and voice channels is stated in Goodman's text: "AMPS uses the term voice channel to denote the format of system control information carried on a physical channel that also carries user information. A forward voice channel carries system control information from a base station to a terminal while a call is in progress. A reverse voice channel carries system control information from a terminal to a base station when a call is in process." (page 88) Table 3.3, pages 98-99, lists the AMPS messages on the forward and reverse control channels and the forward and reverse voice channels.

59. A person of ordinary skill in 1995 and 1996 would also have been aware that both the forward and reverse control channel signals were digital signals.

60. As pointed out by the '144 patent, a person of ordinary skill in the art would have been aware that the control channel signals were relatively short in duration. Further, such a person would also have known that there are multiple control channel signals within an area utilized by the MSs.
61. Although called the "voice channel," a person of ordinary skill in the art in 1995 – 1996 would have been aware that the voice channel has both voice data and control type information, such as the link control information mentioned above. The voice data is coded voice transmissions from a MS.
62. A person of ordinary skill in the art at this time would also have been aware of at least three different air interface protocol schemes for transmitting a person's voice transmissions. First, there was a system, already mentioned, called AMPS, which was a predominant system in 1995 and 1996. (AMPS entered service in 1983 and in 1997 there were more than 40 million subscribers.) AMPS is a frequency modulated system. In an AMPS systems, all MS users in a given area were assigned a different frequency on which to speak. This system used analog FM modulation for the voice data and digital modulation, i.e., FSK, on the control channel. Another air interface protocol for coding voice systems, was time division multiple access or TDMA. In the TDMA system, MS's in the same area may share the same frequency, but they talk at different times. (The TDMA standard was adopted early in 1990 and entered service late in 1992.) Finally, in CDMA, where all MS's use the same frequency band at the same time, each MS is assigned by the BS a unique user signature, called a PN sequence in the art. (The CDMA standard was adopted in 1993 and entered commercial operation in 1996.) A person of ordinary skill in the art would appreciate the meaningful differences between voice data



and control channel signals for all three air interface protocols. Although a person of ordinary skill in the art in 1995 and 1996 would have been aware of these air interface protocols, such a person would have been focused on designing a system that is compatible with AMPS since it was a predominant air interface protocol at that time.

63. Claim 16 of the '192 patent specifies that "the replicated signal data comprises voice related data." Thus, this claim is directed to locating MS's using the coded voice transmissions or voice related data on the voice channel. In contrast, the '144 patent discloses a "Control Channel Signal Detection" system that locates MS's on the reverse control channel. (Col. 14 – 16.). There is no teaching in the '144 patent of a system that uses voice related data as the '192 patent's claimed replicated signal data. In fact, the '144 patent does not even mention locating a MS with replicated voice related data. Thus, because there is no mention or teaching of locating with replicated voice related data in the '144 patent, there is in my opinion no anticipation of claim 16 of the '192 patent.

64. Further, there is no anticipation because Claim 16 recites several other claim elements that the '144 patent does not teach. Claim 16 recites a reduction mechanism that reduces the received voice related data. The '144 patent does not teach a reduction mechanism for reducing voice data. Claim 16 recites a reconstruction mechanism that reconstructs the voice related data. The '144 patent does not teach a mechanism for reconstructing reduced voice data. There is no mention or teaching whatsoever in the '144 patent of demodulating (reducing) and remodulating (reconstructing) voice related data for use in correlation. Claim 16 further recites signal measurement extraction processing units that correlate time-tagged voice data and replicated voice data. The '144

patent does not teach the claimed measurement extraction and processing units for correlating voice data with replicated voice data. Rather, the '144 patent teaches a control channel detection system whose components are described as working with digital reverse control channel signals. There is no teaching in the '144 patent of how to do any of the '192 patent's claimed signal processing of coded voice data. Thus, because the '144 patent fails to teach several of the '192 patent claim elements, there is no anticipation.

65. For a variety of reasons, one of ordinary skill reading the '144 patent in 1996 would not understand the '144 patent to teach the reduction or reconstruction of any voice related data. First, the '144 patent nowhere expressly mentions performing reduction or reconstruction of any voice related data. The '144 patent's only teaching concerning the reduction or reconstruction of signal data is expressly limited by the '144 patent disclosure to the reconstruction and reduction of control channel data, not voice related data (Col. 14:45 – Col. 15: 53). Second, the '144 patent nowhere mentions any method or technique of encoding or decoding voice related data. The reduction and reconstruction method recited in Claims 15, 16 and 20 includes methods of encoding and decoding signal data. One of ordinary skill would therefore expect some discussion by the '144 patent of the encoding or decoding of voice related data in order to reach the conclusion that the '144 patent teaches the reduction or reconstruction of voice related data as recited in Claim 16. The '192 patent, for example, describes linear predictive coding, dynamic companding and other techniques of reduction or reconstruction of voice related data (Col. 11: 48 – Col. 12:26; Col. 13:6-Col.14:20). The '144 patent nowhere mention any such techniques. Further, neither the reduction nor reconstruction of any

voice related data is inherently required by the '144 patent. In fact, the '144 patent expressly states that, even when using the control channel to locate cell phones, correlation need not be performed at the cell sites for MS location. (Col. 15: 54 – Col. 16: 2).

66. My opinion that the '144 patent does not teach voice related data that is replicated is further supported by evidence relating to the '192 patent prosecution history. Two facts relating to the 192 patent prosecution history suggest that the Examiner reviewing the application that became the '192 Patent consciously considered whether the '144 patent discloses voice related data that is replicated but decided that '144 patent did not disclose such replicated voice data. First, the Examiner considered the '144 patent reference before allowing the '192 Patent to issue. Second, the Examiner allowed the '192 Patent even though the '192 patent inventors specifically called to the Examiner's attention the 144 patent's discussion about replication on the reverse control channel. The 192 Patent specification states that the 192 Patent "invention extends the applicability of matched-replica processing" in the '144 patent "to enable the processing of . . . voice signals" (Col. 2: 62 – Col. 3:3). The Examiner no doubt read this passage concerning the '144 patent in the disclosure section of the application, but allowed the '192 Patent claims anyway.

67. In addition, the '144 patent does not anticipate Claim 16 because the '144 teaches that its "Control Channel Signal Detection" system was for solving problems that are peculiar to control channel signals, as opposed to other types of signals like voice data. According to the '144 patent, control channel signals are problematic because they "are very short." (Col. 4:51-55). The '144 patent "detection system" was aimed at solving the

problem of detecting these very short control channel signals (Col. 14:46-47; Col. 4:62-68). Because in 1995 - 1996 a person of ordinary skill in the art reading the '144 patent would have understood that the '144 patent's detection system was for detecting these very short control channel signals, such a person would not have understood the '144 patent to be teaching using voice related data as replicated data. In fact, the '192 patent inventors explained this very point to the patent office right in the '192 patent itself (Col. 2:45-3:52). Apparently, the Examiner agreed with them because he granted the '192 patent. Thus, because the '144 patent teaches a "Control Channel Detection" system, not a replicated voice data location system, there is no anticipation of Claim 16.

68. The '144 patent does not anticipate Claim 16 of the 192 patent for the additional reason that the '144 patent criticizes using the voice channel in its "Control Channel Detection" system. The '144 patent specification states: that the voice channel is expensive and a scarce resource (Col. 4:26), using the voice channel would require the "cellular telephone would have to be called and commanded to initiate a voice channel call every time a location sample were to be taken" (Col. 4: 29-33), a voice channel transmission would add a large burden to the billing system (Col 4: 36-41), the frequency of control channel transmissions are software controllable, while voice transmission are not (Col 4: 45-50), "control transmission are very short in comparison to voice channel transmissions" (Col. 4:51-55). Thus, there is no teaching or suggestion in the '144 patent to use voice related data as replicated signal data. Rather, there is a teaching away from using voice related data as replicated data, and for this additional reason Claim 16 of the '192 is not anticipated by the '144 patent.

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69. Furthermore, claim 16 of the 192 patent is not anticipated by the '144 patent because it refers to voice channel tracking with voice signals "as an adjunct to control channel tracking" (Col. 6:29-38). Again, there is no teaching to use voice related data as replicated signal data. Rather, the '144 patent refers to an "adjunct voice channel system" that is an adjunct to the "Control Channel Detection System." In my opinion, one of ordinary skill in the art in 1995 and 1996 would have understood the '144 patent's single paragraph discussion of an adjunct voice channel location system to be a reference to voice channel location systems that were then known in the art. For example, Smith, William W., "Passive Location of Mobile Cellular Telephone Terminals," IEEE, 1991, pp. 221-225, which is a prior art reference listed in the patent, teaches location with the voice channel's SAT tones, which have a control function and are embedded in the voice signals.

70. In 1995 and 1996, one skilled in the art would have understood that the '144 patent's reference to an adjunct voice channel system was to prior art voice channel systems, as opposed to a system that uses replicated voice data, because the invention of the '144 patent was a "control channel detection system" that located MS's with timing information. It was known before the '144 patent to locate MS's using other techniques. Thus, a person of ordinary skill in the art in 1995 and 1996 reading the '144 patent and being aware of these other location systems, would have understood that the '144 patent's brief discussion of an adjunct voice channel system meant that prior art voice channel systems could be used in addition to the '144 patent's new control channel based timing system. Thus, for example a person of ordinary skill in the art would have understood

that the Smith SAT tone detection system could have been used as an adjunct system to the '144 patent's control channel detection system.

71. Further, I understand that while patents should explain the invention, they preferably omit that which is known in the prior art so that they do not become excessively long. Given the '144 patent's passing reference to an adjunct voice channel system, it is my opinion that the '144 patent did not explain it in detail because the inventors were referring to those systems, such as the Smith SAT tone system, that were known. Thus, in my opinion the '144 patent's reference to an adjunct voice channel system does not teach the replicated voice related data system claimed in the '192 patent.
72. In my opinion, Claim 16 is nonobvious in light of the '144 patent. It is my opinion that a person of ordinary skill in 1995 and 1996 reading the '144 patent would have been motivated to implement the '144 patent's control channel timing system because of its high capacity and robustness. There are many differences between the '192 patent's replicated voice data system and the '144 patent's control channel detection system. There is no motivation or suggestion in the '144 patent to deviate from the teachings of the '144 patent.
73. There are many differences between the '144 patent and the '192 patent's claimed replicated voice data system. These differences include: locating with known periodic digital control channel information, as opposed to encoded random voice data system; the control channel system dealt with the problem of how to build a large location database that could be maintained independent of the number of E911 events; no communication between the wireless communication system and the location system in the '144 patent. By way of contrast, the claimed replicated voice data system deals with the problem of

how to locate specific callers when they are talking on the mobile without building up a database and with required communications from the wireless communication system.

The control channel system described by the '144 patent is an all inclusive system, monitoring all calls, while the claimed replicated voice data system is directed at specific MS's. The control channels are digital while the voice data in 1995 and 1996 included analog information. Considering at least these differences, the level of skill in the art, and the lack of any suggestion or motivation to deviate from the '144 patent's teaching, it is my opinion that the claimed invention is nonobvious over the '144 patent. I address each of these differences and the lack of any suggestion or motivation to use a replicated voice data system below.

74. The '144 patent provides no teaching or suggestion to use voice related data as replicated data in the system claimed in the '192 patent because the '144 patent fails to mention locating with voice related data as replicated data, criticizes even using the voice channel, either the voice channel control information or coded voice data, and teaches to use prior art voice channel location systems as an adjunct or in addition to the '144 patent's control channel detection system. As described above there are many aspects of a replicated voice data system that the '144 patent does not teach including how to reduce and remodulate voice data. Thus, a person of ordinary skill in the art reading the '144 patent would not have been motivated to develop a system that is based on replicated voice data.

75. Furthermore, a person of ordinary skill in 1995 and 1996 would not have been motivated by the '144 patent to utilize voice related data as replicated data in the system claimed in Claim 16 of the '192 because of the difference in control channel signals and

encoded voice data at that time. In 1996, as mentioned previously, a predominant air interface protocol was AMPS, which has an analog modulation scheme for voice. One of ordinary skill in the art would have thought in 1995 and 1996 that the correlation detection system taught by the '144 patent would not work well, if at all, with analog voice related data. In fact, I have reviewed a 1997 document from Grayson (a division of Allen Telecom) that describes the difficulties in trying to correlate voice-related data in systems that uses the AMPS air interface protocol (Ex. 146). It was recognized that the limited signal bandwidth of AMPS encoded voice signals makes correlation with them problematic. Thus, one skilled in the art in 1995 and 1996 who had the '144 patent and was trying to develop a geolocation system, would have been motivated to implement the '144 patent control channel detection system and would not have been motivated to develop a system that uses voice related data.

76. In addition, one skilled in the art would not have been motivated to form the invention of claim 16 of the '192 patent because the '144 patent and the '192 patent are based on different premises and approaches to geolocation. The '144 patent teaches an inclusive control channel location system for locating all MS's with timing information. The '144 patent's control channel system monitors all of the control channels and locates a MS when the control channel is detected, and stores the locations in a database (Col. 5: 31-33). According to the '144 patent, subscribers could have access to the data base to determine the location of a MS (Col. 5:33-35). The '144 patent system could further provide a billing system that would generate bills or different charges based on the location of the MS caller (Col. 5:44-55, Col. 19:5-22). In order to accomplish this on the control channel, the '144 patent teaches that all of the reverse control channels within a



given area have to be monitored so that the MS location can be determined periodically and the data base can be updated (Col. 4:12-16, Col. 4:59-62, Col. 8:26-30). Because reverse control channel signals are predictable and occur periodically as opposed to voice signals which occur randomly, the '144 patent teaches that control channel signals should be used for creating this location data base. The '144 patent teaches that in order to locate the MS and maintain this database, the control channel should be used so that the MS can be located even when it is not making a call, which is most of the time. One skilled in the art would not have been motivated to depart from this system because, as the '144 patent points out, voice channel transmissions are random, and the voice channel should not be used because the caller would have to be called and commanded to initiate a call (Col 4:29-33). Further, the claimed '192 patent's voice data system is of lower capacity because it is not able to continuously update a caller's location independent of his call. Thus, one skilled in the art would not have been motivated to form a lower capacity system that locates using voice related data because, according to the '144 patent, it would require calling the MS to initiate a voice transmission, it would be a lower capacity system, and could not be updated with a caller's location on a regular basis independent of a voice transmission without calling the MS.

77. The '192 patent is not obvious for the additional reason that it recognized a problem with the approach of the '144 patent. While accurate, the '144 patent required monitoring all of the reverse control channels within a given area. It could not immediately locate a caller who was calling for 911 assistance. Rather, the '144 patent taught locating with the initial setup reverse control channel emission and updating continuously every time there was a reverse control channel emission. In this way, the database could be updated and if

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an E911 call was made, a current location would be already stored in the database. The '192 patent inventors recognized problems with this approach including excessive back haul communications in transmitting large amounts of data to do periodic locations, expensive receivers to monitor all of the control channels, and large-scale processing to produce the periodic locations of all of the subscribers in an area. Thus, the invention of the '192 patent went in a different direction than the teaching of the '144 patent. They developed a responsive system that used voice data so that a location could be made when a voice transmission was made such as in the E911 environment. The '192 patent presents a different approach to the data base location technique than is presented in the '144 patent because it does not use a database system that locates a MS at regular periodic intervals. Thus, the '192 patent inventors recognized this approach, and there is no motivation in the '144 patent to proceed in the direction that the '192 patent inventors went.

78. It is my understanding that TruePosition itself is an example of the lack of motivation to deviate from the teachings of the '144 patent. Prior to 1998 TruePosition focused on developing and marketing a control channel system of the type taught by its '144 patent. Although robust, this system has been unsuccessful in the market place because it is too robust and too expensive. The inventors of the '192 patent recognized and solved the drawbacks of the '144 patent's system long before TruePosition.

79. I believe that the '192 patent inventors also recognized a benefit to locating with voice data as opposed to the reverse control channel. Voice data signals are longer in duration than the short control channel signals. The inventors of the '192 patent recognized that the longer integration times in processing the replicated voice related data

yields accurate results for MS location purposes. This benefit of using voice related data was not taught by the '144 patent. Rather, the '144 patent criticized using the voice channel for location and focused on processing the short periodic reverse control channel signals.

**2. Claims 15, 18 and 20 of the '192 Patent**

80. Claims 15, 18, and 20 all require that "the replicated signal data comprises voice related data." Therefore my analysis of claim 16 applies to each of them with the same conclusions.

**3. Claims 14, 18 and 19 of the '192 Patent**

81. Claims 14, 18 and 19 require that "the location-related signal parameters comprise angle-of-arrival information." Dr. Ellingson appears to recognize that the '144 patent fails to teach a system for obtaining AOA measurements, and there is no anticipation. He opines that these claims are obvious in view of the '959 patent combined with the '144 patent. I disagree with his analysis and conclusion.

82. The patent office considered both the '144 and '959 patents while examining the application which led to the '192 patent. Since the patent office issued the claims it did not consider them obvious over the '144 and '959. I agree with the patent office.

83. A person of ordinary skill in the art sitting with the '144 and '959 patents in 1996 would not have been motivated to combine them. There is no suggestion or motivation in either the '144 or '959 patents to combine any of their teachings. The '144 patent teaches a control channel timing based location system and makes no mention of an AOA system. The '959 patent teaches an AOA geolocation system and makes no mention of a control channel timing based location system. Furthermore, there is no teaching of how to select

certain components from the two patents and combine them in such a way as to form claim 14 of the '192 patent. Because there is no suggestion or motivation to combine the patents or how to combine them, a person of ordinary skill in the art would not have been motivated to combine them in a way to obtain the invention of claim 14, 18, and 19 of the '192 patent.

### **VIII. Validity of the '959 Patent**

#### **A. Overview of the 959 Patent**

84. The '959 patent is titled: "Direction Finding Localization System." It teaches how to utilize the phase angle differences of a signal arriving at the various elements of an antenna array to determine the direction angle, i.e., AOA, of a MS. Signal processing techniques are used that produce accurate AOA estimates and the probable estimate of the MS.

85. Just as a MS signal arrives at two different base station antennas at different times, when there is an antenna array, i.e., one antenna with multiple elements, the signal arrives at the different elements of an array at different times. This is illustrated in Fig. 4 of the '959 patent. Since the elements are relatively close to one another (see e1 and e2 in Fig. 4 which are separated by  $b$  units), the time difference of arrival of the signal is too small to measure directly. The time difference of arrival of the signal at the two elements corresponds to a phase difference between the two signals. Since the relative phase of the signal at the two elements is the product of the time difference (a relatively small number) multiplied by the frequency of oscillation of the radio signal (a relatively large number), the phase is more readily measured.

86. This product relationship is summarized in the equation in column 7:15 of the '959 patent. The quantity  $2\pi f$  is the frequency of oscillation of the signal. " $b\sin(\alpha)/c$ " is the time difference of the two signals at the two elements, where  $b$  is the distance between the two elements,  $\alpha$  is the AOA of the incoming radio signal,  $\sin( )$  is the trigonometric sine function, and  $c$  is the speed of light. " $b\sin(\alpha)$ " is the extra distance traveled by the radio signal to get to element  $e2$ . The product of these two quantities (time difference and frequency of oscillation) gives the phase difference. Measuring the phase difference, and knowing the other quantities (speed of light, distance between elements, frequency of oscillation), allows one to then calculate the AOA of the radio signal, leading to a line of bearing estimate at the particular BS.
87. The patent teaches, if there are two BS's with antenna arrays that can generate AOA's, then the intersection of the two lines of bearing estimates gives an estimate of the MS. With more BS's generating additional AOA's, the multiple estimates are combined statistically to get a most probable estimate of the location of the MS.
88. This procedure tends to be robust to noise and signal distortions. The drawback is that AOA antennas, i.e., antennas with multiple elements, are expensive to construct and maintain.

**B. Professor Compton's Report**

89. Professor Compton in his report does not opine on anticipation or obviousness. He focuses on whether the patent specification describes the claimed "phase sensitive weighted integration" sufficiently so as to enable a person of ordinary skill in the art to practice the invention. I have been asked to opine on whether the claimed means for performing phase sensitive weighted integration is disclosed and enabled.

90. I understand that the enablement requirement is satisfied if the patent teaches a person of ordinary skill in the art how to make and practice the claimed invention without undue experimentation. I further understand that issued patents, including the '959 patent, are presumed to have satisfied the enablement standard.
91. The Court has construed the "means for performing a phase sensitive weighted integration clause" in the following manner. "Phase sensitive" is construed to mean "having a phase." "Weighted" is construed to mean "having been assigned more or less importance based on identity, amplitude, phase, or other characteristics." "Integration" is construed to mean "a summing." "Equivalent analytic signal" is construed to mean "a frequency-translated complex value pair." "Complex conjugate product" is construed to mean "the result of a multiplication of a complex pair and its conjugate."
92. In my opinion the patent discloses the means for performing a phase sensitive weighted integration. In particular, in Col. 10:12-24, Col. 10:34-41, and Figure 6, blocks 606, 607 and 608. Through the time gating and integration process described, a "means for performing a phase sensitive weighted integration" is disclosed. The process uses phase sensitive data. This data is weighted by the process of time gating and integration, where the integration is performed in block 606 as described in Col 10: 12- 24. This integration is done with a complex conjugate product (block 605) of a frequency-translated complex value pair (blocks 601 and 611). One skilled in the art could implement this without undue experimentation.
93. The process just described weights by identity and automatically by amplitude and phase. Additional weighting by phase is described in Col 10: 51-57, where the phase of the incoming signals are monitored and compared to past phases stored in RAM memory.

Outliers can then be attributed to multipath interference and weighted accordingly.

“Upon subsequent processing, the integration weights are made functionally dependent upon both amplitude and phase thresholds of the measured signal.” (Col. 10:57-60).

Upon reading this, a person of ordinary skill in the art could also make and use the claimed system with this other weighting procedure without undue experimentation.

94. It is my opinion that the process of integrating, or summing, the complex conjugate products of the equivalent analytic signals has the effect of *weighting* (giving more importance to) the direct path signals relevant to the multipath or other noise signals. This integration is phase sensitive and inherently amplifies the difference between the stronger, direct path signals and the weaker, multipath/noise signals. In this regard, I note that the complex conjugate product of a signal on one antenna element and its counterpart on another antenna element is approximately proportional to the *square* of the voltage amplitude of the signal.

95. I also note that the patent office must have agreed that the claimed “means for performing” clause is enabled because during the prosecution history of the 959 patent, the patent applicants added this language to the claim and expressly explained its meaning to the Examiner. Since the patent examiner raised no objection, he must have considered the claim enabled.

96. Thus, the means for performing a phase sensitive weighted integration is disclosed and a person of ordinary skill in the art could also make and use the claimed system without undue experimentation at the time of the filing of the application leading to the issuance of the 959 patent until today.

97. It is not clear whether Professor Compton believes that the '959 patent claims are anticipated by U.S. Patent # 4,034,376 ('376 patent). He does not opine on whether all the elements of the asserted claims are expressly or inherently taught in the document. I have been asked, however, to analyze whether the '376 patent anticipates. In my opinion, there is no anticipation because at least three elements are not expressly or inherently taught.
98. All the claims require "a network of interconnected land stations having known locations." The '376 patent has no such requirement or teaching.
99. As construed by the Court, the "means for measuring" clause in Claims 1 through 6, requires an analog-to-digital converter or equivalent structure. There is no such piece of equipment in the '376 patent.
100. As construed by the Court, the means for processing "said direction angle measurements" clause of claims 1-6 means "a processor that is capable of determining the location of the target mobile radio transmitter through the nonlinear relation of the location coordinates for at least two angles of arrivals and equivalents." The '376 patent does not have or teach such a processor.
101. As construed by the Court, the "measuring a direction angle" clause for claims 7-9 means "ascertaining the direction of signal arrival of the target mobile radio transmitter from the difference between the phase of the signal at one antenna element and the phase of the signal at a second antenna element." The '376 patent does not teach such a method.

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102. Claims 3 and 8 contain further limitations regarding cellular telephones, cellular telephone networks, and the nature of the RF signal. None of this is taught in the '376 patent.
103. Based on at least these differences, the '376 patent does not anticipate the '959 patent.

**IX. Other Matters**

104. I have been engaged by TruePosition and am being compensated for this matter at the rate of \$450 per hour for services provided.
105. In the last five years, I have been engaged as an expert witness in the following matters:
1. Ericsson Inc. et. al. vs. Qualcomm Inc., U.S. District Court, Eastern District of Texas, Marshall Division, Civil Action No. 2-96CV183-DF/hwm Consolidated
  2. GE-Harris Railway Electronics, L.L.C., and GE-Harris Railway Electronics Services, L.L.C. Vs. Westinghouse Air Brake Company, Civil Action No 99-070GMS, United States District Court, District of Delaware
  3. International Trade Commission: In the Matter of Certain Network Interface Cards and Assess Points for Use in Direct Sequence Spread Spectrum Wireless Local Area Networks and Products Containing Same, Investigation No. 337-TA-455. (Complainant is Proxim, Inc. Agere is representing the 8 respondents.)
  4. Nortel Networks Limited and Nortel Networks Inc., vs. Kyocera Wireless Corp., Civil Action No. 3-02CV032-D, United States District Court, Northern District of Texas, Dallas Division.
106. I anticipate testifying on issues of both infringement and validity.
107. In addition, I anticipate that I may be called upon to provide additional testimony in rebuttal to Allen Telecom's experts and in other matters related to or in further

amplification or clarification of the foregoing. Further, I may also testify regarding the relevance of any alleged misstatements or materiality of any documents that Allen contends form the basis of its inequitable conduct allegations.

108. In presenting my testimony I may use demonstrative exhibits, such as charts referring to the figures in the patents or the references relied upon by Allen's experts. The opinions rendered in this report may be modified if relevant new information is obtained. I also understand that I may be asked to respond to the opinions or issues raised by other experts. In addition, the opinions may be modified following any ruling by the Court.

Dated: \_\_\_\_\_

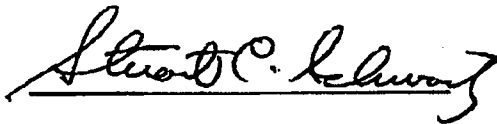
Stuart C. Schwartz

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amplification or clarification of the foregoing. Further, I may also testify regarding the relevance of any alleged misstatements or materiality of any documents that Allen contends form the basis of its inequitable conduct allegations.

108. In presenting my testimony I may use demonstrative exhibits, such as charts referring to the figures in the patents or the references relied upon by Allen's experts. The opinions rendered in this report may be modified if relevant new information is obtained. I also understand that I may be asked to respond to the opinions or issues raised by other experts. In addition, the opinions may be modified following any ruling by the Court.

Dated: July 28, 2003



Stuart C. Schwartz

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CERTIFICATE OF SERVICE

I certify that I am counsel for Plaintiffs, TruePosition, Inc. and KSI, Inc., and that a true copy of the foregoing Dr. Schwartz's Expert Report On Validity of the '55, '013, '192, and '959 Patent's was served on counsel for Defendant, Allen, Inc. on this date by \_\_ first class mail, postage prepaid; XX Overnight Mail Service; XX Telecopier; \_\_ Hand, addressed as follows:


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Date: July 28, 2003

  
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-and-

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Attorneys for TruePosition, Inc. and  
KSI, Inc.

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# Exhibit H

Joseph Sheehan October 19, 2006

Page 1

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE

TRUEPOSITION, INC.,

Plaintiff,

Civil Action

v.

No. 05-747

ANDREW CORPORATION,

Defendant.

Videotaped Deposition of  
JOSEPH SHEEHAN  
Philadelphia, Pennsylvania  
Thursday, October 19,  
9:41 a.m.

Job No: 25500122

Pages 1-170

Reported By: Christine M. Baird, CRR

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Legalink, a Merrill Communications Company  
(312) 263-3524 (312) 236-8461

Joseph Sheehan October 19, 2006

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1 Q The AMPS technology?

2 A Yes, I believe so.

3 Q Does AMPS stand for advanced mobile phone  
4 system?

5 A Yes.

6 Q To your knowledge, does the AMPS air  
7 interface involve control channels?

8 A Yes.

9 Q What is the control in the AMPS interface;  
10 what is it called?

11 A I believe a reverse control channel -- let  
12 me correct that. There is multiple control channels  
13 called out in the AMPS specifications.

14 Q What control channels are called out in the  
15 AMPS specification?

16 A I believe there is forward control channels  
17 and there is reverse control channels. There may be  
18 others, I'm not certain of that.

19 Q Are you familiar with the CDMA air  
20 interface?

21 A Yes. Although, there is multiple CDMA air  
22 interfaces. So Could you be more specific?

23 Q And CDMA stands for co-division multiple  
24 access; correct?

25 A Correct.

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Joseph Sheehan October 19, 2006

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1 Q Yes. Le me rephrase the question.

2 Did you believe that the '144 Patent is  
3 essential to any ETSI standard?

4 MS. MILSARK: Objection, vague.

5 THE WITNESS: Any? Can you be more  
6 specific than any?

7 BY MR. PARKS:

8 Q Sure. Do you think the '144 Patent is  
9 essential to the practice of U-TDOA?

10 MS. MILSARK: Objection, vague.

11 THE WITNESS: In the context of ETSI?  
12 BY MR. PARKS:

13 Q Yes, let's take it that way.

14 A As U-TDOA is defined today in ETSI, no, the  
15 '144 Patent is not essential.

16 Q How is U-TDOA defined today in ETSI?

17 A As it is embodied in the number of  
18 technical specifications that are defined.

19 Q What is the basis for your statement that  
20 the '144 Patent is not essential as U-TDOA is defined  
21 today in ETSI?

22 A Because there are technical -- there are  
23 technical implementations or solutions that can be  
24 implemented to implement what is defined in the  
25 standards that don't infringe upon that patent.



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1 Q What are those technical implementations  
2 and solutions that you are referring to?

3 A For example, you can locate the mobile  
4 utilizing traffic channels.

5 Q Anything else?

6 A Yes. There are multiple positioning  
7 technologies defined in the standards. You are not  
8 required to use any one in particular, so you have  
9 alternatives and options to use any one or more of  
10 those technologies.

11 You have many different use cases on which  
12 you can actually use to locate the mobile. You can  
13 use any one or more of those options.

14 Q Anything else?

15 A Not that I can think of right now off the  
16 top of my head, but that doesn't mean there aren't  
17 other reasons.

18 Q Is it your belief then, that locating a  
19 mobile phone using a traffic channel would not  
20 infringe the '144 Patent?

21 A I believe that's right, depending upon the,  
22 you know, specific circumstances.

23 Q What do you mean by the specific  
24 circumstances?

25 A And there is multiple claims within the

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1 patent that I'm not specifically familiar with off the  
2 top of my head. But, for example, in an idle mode  
3 scenario, if the mobile were to be put on a traffic  
4 channel and then located, that would not, I believe  
5 infringe upon the '144 Patent, depending again on  
6 specifically how that's done.

7 Q Under what circumstances would putting a  
8 phone in idle mode using the traffic channel infringe  
9 on the '144 Patent?

10 MS. MILSARK: Objection. That misstates  
11 what he said.

12 THE WITNESS: Yeah. Again, I'm not, off  
13 the top of my head, familiar with all the specific  
14 claims in the '144 Patent and all of the things  
15 related to locating a mobile in that scenario. So,  
16 you know, I know there are -- I know there is the  
17 ability to do that without infringing on the '144  
18 Patent. It is done in specific ways.

19 BY MR. PARKS:

20 Q And again, do you know what those specific  
21 ways are?

22 A I don't, off the top of my head. I  
23 wouldn't be able to explain it.

24 Q Do you know who at TruePosition is most  
25 knowledgeable about the '144 Patent?

# Exhibit I

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE**

<b>TruePosition, Inc.,</b>	)	
	)	
<b>Plaintiff/</b>	)	
<b>Counterclaim-Defendant,</b>	)	
	)	<b>Civil Action No. 05-747-SLR</b>
<b>v.</b>	)	
	)	
<b>Andrew Corporation,</b>	)	<b>CONFIDENTIAL</b>
	)	
<b>Defendant/</b>	)	
<b>Counterclaim-Plaintiff.</b>	)	
	)	

---

**PLAINTIFF'S SEVENTH SUPPLEMENTAL RESPONSES  
TO DEFENDANTS FIRST INTERROGATORIES**

Pursuant to Rule 26(e) of the Federal Rules of Civil Procedure, Plaintiff, TruePosition, Inc. ("TruePosition"), hereby further responds to Defendant, Andrew Corporation's ("Andrew's") Interrogatory No. 6 of Andrew's First Interrogatories.

TruePosition continues to reserve all objections to the competency, relevancy, materiality, or admissibility at trial of any response to the propounded interrogatories, or to any document produced in response thereto, and reserves the right to amend, modify, or supplement its responses or objections herein, or to move for a protective order.

that TruePosition may use to support its claims or defenses, and the categories of information each such person may have, see TruePosition's Rule 26(a)(1) Initial Disclosures dated February 24, 2006, TruePosition's Rule 26(a)(1) Supplemental Initial Disclosures served September 19, 2006, and any supplements or amendments that TruePosition may make thereto.

TruePosition reserves the right to supplement its response to this interrogatory.

**INTERROGATORY NO. 5:**

State whether TruePosition contends that it is possible to practice U-TDOA positioning in compliance with all ETSI standards without infringing the 144 Patent, and if so, how.

**RESPONSE TO INTERROGATORY NO. 5:**

TruePosition objects to this interrogatory as vague, ambiguous, and confusing, in that the term "standards" is not defined by Andrew, there are no ETSI Standards or Technical Specifications devoted exclusively to U-TDOA positioning, and Andrew has not identified what "standards" this interrogatory refers to. TruePosition further objects to this interrogatory as overly broad, in that it is unlimited in time and there have been numerous versions of ETSI Location Services Standards and/or Technical Specifications over time, some of which have included U-TDOA positioning as one of various optional technologies that may chosen to implement the Location Services Standards and/or Technical Specifications, and some of which have not included U-TDOA positioning as a technology option that may be chosen to implement Location Services in compliance with the Standards and/or Technical Specifications. Subject to the foregoing general objections, and without waiving those objections, TruePosition responds as follows:

TruePosition believes, and has always believed, that it is possible to practice U-TDOA positioning in compliance with all ETSI standards that it is aware of without infringing the 144

Patent. By way of example, a person or business practicing U-TDOA positioning on a mobile telephone's reverse voice channel exclusively, that does not ever locate mobile telephones on a reverse control channel, can be in full compliance with all ETSI standards that TruePosition is aware of, and yet not infringe the 144 Patent.

TruePosition's investigation is continuing and it reserves the right to supplement its response to this interrogatory.

**INTERROGATORY NO. 6:**

State which claims of the 144 Patent TruePosition contends Andrew has infringed or will infringe in the future and state the basis for alleging such infringement (including, without limitation, the factual basis for the allegation in paragraph 28 of TruePosition's Complaint), including identification of any component of any accused Andrew Product that TruePosition contends pursuant to 35 U.S.C. §271(f) is especially made or especially adapted for a use that practices any element of any claim of the 144 Patent.

**RESPONSE TO INTERROGATORY NO. 6:**

Refer to the general and specific objections set forth in TruePosition's response to Interrogatory No. 6.

In addition, and subject to the foregoing general and specific objections, and without waiving those objections, TruePosition further responds as follows:

**TruePositions Infringement Contentions**

Andrew has infringed, and will infringe, claims 1, 2 and 31 of the 144 Patent by using and offering for sale within the United States configuration(s) of its Geometrix Wireless Location system that infringes those claims, pursuant to 35 USC §271(a). And has also

CLAIM 1	WHERE CORRESPONDING ELEMENT CAN BE FOUND IN SYSTEM OFFERED DECEMBER 2004 OFFER
	<p>The multiple cellular telephones each initiate periodic signal transmissions over a standalone dedicated control channel.</p> <p>See, e.g., PX-218 at 33 of 55, noting that the offered system will locate the phones “where interaction occurs on the SDCCH [standalone dedicated control channel] (such as an SMS message or a registration)”;</p> <p>10/16/06 Deposition Transcript of Andrew Corporation by Joe Kennedy, p. 39, ll. 18-25.</p>
<ul style="list-style-type: none"> <li>• (a) at least three cell site systems, each cell site system comprising:</li> </ul>	<p>Three or more of the between 2866 and 4300 Version 2 Geometrix Location Measurement Units (LMU's) (also known as Wireless Location Units (WLS's)) offered to STC.</p> <p>See, e.g., PX-218 at 20 of 55, Table 2.1.1.</p>
<ul style="list-style-type: none"> <li>• an elevated ground based antenna;</li> </ul>	<p>The BCCH antenna portion of each LMU/WLS offered to STC.</p> <p>See, e.g., PX-218 at 10 of 55, noting that the offered LMU's/WLS's are connected “to a combination GPS/downlink antenna.”</p>
<ul style="list-style-type: none"> <li>• a baseband convertor operatively coupled to said antenna</li> </ul>	<p>The “RF Down Converter” alone, or, in the alternative, the combination “RF Down Converter” and the “Digital Down Converter,” in each of the Version 2 LMU's/WLS's offered to STC.</p> <p>See, e.g., PX-115, Blocks “RFD” and “DDC”; AND0080260 –</p>

CLAIM 1	WHERE CORRESPONDING ELEMENT CAN BE FOUND IN SYSTEM OFFERED DECEMBER 2004 OFFER
	<p>AND0080328.</p> <p>Both the RF Down Converter alone, and the combination RF Down Converter and Digital Down Converter, are operatively coupled to the BCCH antenna.</p> <p>See, e.g., 10/14/06 Deposition Transcript of Alan Li at p. 149, ll. 1-13.</p>
<ul style="list-style-type: none"> <li>• <b>for receiving cellular telephone signals transmitted over a reverse control channel by said cellular telephones</b></li> </ul>	<p>Both the “RF Downconverter” alone, and the combination “RF Downconverter” and the “Digital Downconverter,” are for receiving cellular telephone signals transmitted by the cellular telephones.</p> <p>See, e.g., PX 115.</p> <p>The cellular telephones transmit signals over a standalone dedicated control channel.</p> <p>See, e.g., PX-218 at 33 of 55, noting that the offered system will locate the phones “where interaction occurs on the SDCCH [standalone dedicated control channel] (such as an SMS message or a registration).”</p>
<ul style="list-style-type: none"> <li>• <b>and providing baseband signals derived from the cellular telephone signals;</b></li> </ul>	<p>Both the RF Down Converter alone, and the combination “RF Down converter” and the “Digital Downconverter,” are for providing baseband signals derived from the standalone dedicated control channel signals.</p> <p>See, e.g., PX 218 at 12 of 55, “Baseband Processing Unit”;</p>



CLAIM 31	WHERE CORRESPONDING STEP CAN BE FOUND IN SEPTEMBER/OCTOBER ASHBURN VA DEMONSTRATION
	<p>See, e.g., 09/22/06 Deposition Transcript of Andrew Beck at p. 198, l. 16 – 200, l. 5.</p> <p>The method was for determining the location of a cellular telephone.</p> <p>See, e.g., PX-12 at p. 3, referencing a “Motorola T720 GSM phone”; PX-12 at p. 5, referencing that the method “calculates mobile position.”</p> <p>The cellular telephone phone initiated periodic signal transmissions over a standalone dedicated control channel.</p> <p>See, e.g., 08/22/06 Deposition Transcript of Andrew Beck, p. 202 at ll. 4-8; PX-12, at p. 4 referencing “control channel combinations V(SDCCH/4) and VII (SDCCH/8).”</p>
<ul style="list-style-type: none"> <li>• (a) receiving said reverse control channel signals at least three geographically separated cell sites;</li> </ul>	<p>At the demonstration, Andrew received the standalone dedicated control channel signals at three geographically separated cell sites, each cell site comprising a Version 2 WLS connected to two mounted RF antennas.</p> <p>See, e.g., PX-12 at p. 4, referencing “3 WLS boxes will be used (minimum for fix calculation)”; PX-12 at p. 3, referencing that the WLS’s are each “using 2 diversity path 6db gain omni directional antennas”; 10/02/06 Deposition Transcript of John Carlson at p. 124, l. 14 – p. 128, l. 16; 10/16/06</p>

CLAIM 1	WHERE CORRESPONDING ELEMENT CAN BE FOUND IN SYSTEM OFFERED IN POST-COMPLAINT OFFER
<p>determining the locations of multiple mobile cellular telephones each initiating periodic signal transmissions over one of a prescribed set of reverse control channels, comprising:</p>	<p>Location System” offered to STC.</p> <p>See, e.g., PX-63 at 2 of 55. “Our offer to STC is to satisfy the UTDOA requirements of the location based service (LBS) network components with our Geometrix® Wireless Location System.”</p> <p>The system offered was for determining the locations of multiple mobile cellular telephones.</p> <p>See, e.g., PX-63 at 32-33 of 55, Fig. 2.2.11.</p> <p>The multiple cellular telephones each initiate periodic signal transmissions over a standalone dedicated control channel.</p> <p>See, e.g., PX-63 at 33 of 55, noting that the offered system will locate the phones “where interaction occurs on the SDCCH [standalone dedicated control channel] (such as an SMS message or a registration); 10/16/06 Deposition of Andrew Corporation by Joe Kennedy, p. 39, ll. 18-25.</p>
<ul style="list-style-type: none"> <li>• (a) at least three cell site systems, each cell site system comprising:</li> </ul>	<p>Three or more of the between 2866 and 4300 Version 3 Geometrix Location Measurement Units (LMU’s) (also known as Wireless Location Units (WLS’s)) offered to STC.</p> <p>See, e.g., PX-63 at 20 of 55, Table 2.1.1; PX-60.</p>
<ul style="list-style-type: none"> <li>• an elevated ground based antenna;</li> </ul>	<p>The BCCH antenna portion of each</p>

Interrogatory No. 16 (Marking of TruePosition's Geolocation System) – Rob Anderson, Chief Technology Officer at TruePosition, has knowledge of marking of TruePosition's Geolocation System.

Interrogatory No. 17 (Prior Art) - Michael Stein, Esq. has knowledge of the prior art searches described in TruePosition's response to Interrogatory No. 17.

TruePosition's interrogatory responses are based upon information obtained from at least the following individuals at TruePosition: Joseph Sheehan, Rob Anderson and Bob Gross.

DATED: November 6, 2006

By: /s/ Daniel J. Goettle

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IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE

TruePosition, Inc.,	)	
	)	
Plaintiff/	)	
Counterclaim-Defendant,	)	
	)	Civil Action No. 05-747-SLR
v.	)	
	)	
Andrew Corporation,	)	
	)	
Defendant/	)	
Counterclaim-Plaintiff.	)	
_____	)	

CERTIFICATE OF SERVICE

I, Daniel J. Goettle, hereby certify that on this 6<sup>th</sup> day of November, 2006, I served the foregoing TruePosition's Seventh Supplemental Responses to Defendant's First Interrogatories on counsel for defendant Andrew Corporation as follows:

*Via Electronic Mail, Return Receipt Requested*

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